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24 June 2004

**The Commissioner of Patents**  
Woden, A.C.T. 2606

Dear Commissioner,

Re: International Patent Application No. PCT/AU2003/000642  
Title: A Soil Additive  
Applicants: Huw Treers and Donna Sheehy  
Our Ref: 02701PC/GC/RG

We refer to the second Written Opinion dated 24 May 2004, which issued on the above application.

With regard to the Examiner's comments regarding the inventiveness of the soil additive according to the present invention and particularly with regard to the selection of basalt, limestone, dolomite and claystone, we note that the Examiner agrees that the use of claystone is not disclosed in either prior art document.

As regards the inventiveness of the selection, we advise that not only does claystone provide a binding agent in the pelletisation process, it also provides extensive surface area when added to the soil, without the time lag required for mineral degradation in prior art soil additives.

As an increase in surface area is provided by the claystone virtually immediately upon addition of the additive according to the present intention to the soil, greater retention of the other constituents in the blended soil additive is achieved immediately upon application. As the remainder of the constituents of the soil additive according to the present invention, particularly the basalt, degrades to become active constituents of the soil profile, they also provide additional active surface area to bind elements and prevent leaching of valuable soil components. This generally takes a period of approximately two weeks from application and during this period, leaching of valuable soil constituents can occur, especially if rain falls on the soil. The clay present in the claystone however is available immediately, increasing the active surface area immediately, and providing for the enhanced retention of the carbonate dusts and other valuable constituents of the soil, the retentive qualities enhanced when the basalt begins to degrades.

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Further, the clay stone used according to the invention has a lower shrink/swell property than "pure" clay. Whilst the shrink/swell property of the additive is important in order to provide new surface area with each wetting event, the swell characteristic of the soil additive of the present invention is reduced thereby limiting over-fluffing of the soil with clay.

The silicate tetrahedron which forms the basic building block for the sheet structure of claystone provides multiple sites for exchange reactions and binding of elements favorable to the soil, thus increasing retention of these elements in the soil. An example of favorable elements are rare earth elements (large ion lithophiles) which are intrinsic to the mineralogy of the basalt dust and also carbonate dusts. These elements and dusts are generally larger elements which need a significant active surface area in order to bind and for this reason are usually the first to be leached from the soil profile during rain events.

Thus the use of claystone in a soil additive, particularly one also having basalt, limestone, and dolomite, dramatically increases the effectiveness of the soil additive. We therefore submit that the invention defined in the claims of the application is inventive and request favorable reconsideration of the Written Opinion.

Yours respectfully,  
**CULLEN & CO.**

**IAN de JONGE**

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